ABBREVIATIONS

A	AMPERE
AFF	ABOVE FINISHED FLOOR
BKR	BREAKER
C, CDT	CONDUIT
CB	CIRCUIT BREAKER
CBC	CROSS BAND COUPLER
CKT(S)	CIRCUIT
DC	DIRECTIONAL COUPLER
DISC	DISCONNECT
DPNL	DISTRIBUTION PANELBOARD
DS	DISCONNECT SWITCH
E	EMERGENCY
E1	EMERGENCY SOURCE #1
E2	EMERGENCY SOURCE #2
ELEC	ELECTRIC, ELECTRICAL
EXIST	EXISTING
EF	EXHAUST FAN
FA	FIRE ALARM
FDS	FUSIBLE DISCONNECT SWITCH
FIN	FINISHED
FL, FLR	FLOOR
FLEX	FLEXIBLE
GFI	GROUND FAULT INTERRUPTER
G, GND, GRD	GROUND
GRS	GALVANIZED RIGID STEEL
GSC	GALVANIZED STEEL CONDUIT
HR	HOME RUN
JB	JUNCTION BOX
KVA	KILO VOLT AMPERES
KW	KILOWATTS
L	LOAD
LA	LIGHTNING ARRESTOR (COAX PROTECTOR)
LTG	LIGHTING
MTD	MOUNTED
MTS	MAINTENANCE TRANSFER SWITCH
N	NORMAL
NC	NORMALLY CLOSED
NFDS	NON-FUSED DISCONNECT SWITCH
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
PA	PORT AUTHORITY NY&NJ
PNL	PANEL
RBS	RADIO BASE STATION
SSC	SIGNAL SPLITTER AND COMBINER
TEMP	TEMPORARY
TF	TRANSFER FAN
TSC	TERMINAL STRIP CABINET
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
VA	VOLT-AMPERE
W	WATTS

GENERAL NOTES

1. ALL EXISTING CONDUIT, WIRING AND EQUIPMENT ARE SHOWN IN LIGHT LINES. CONDUIT, WIRING AND EQUIPMENT UNDER THIS CONTRACT ARE SHOWN IN HEAVY LINES.
2. CONTRACTOR SHALL UPDATE PANELBOARD DIRECTORIES FOR EXISTING PANELBOARDS AFFECTED BY ADDITIONAL LOAD OF AUXILIARY COMMUNICATION EQUIPMENT UNDER THIS CONTRACT.
3. THE CONTRACT DRAWINGS ARE DIAGRAMMATIC IN NATURE AND NOT EVERY DETAIL OR EXACT LOCATION OF EQUIPMENT AND DRAWN CONDUIT IS SHOWN. EXISTING CONDITIONS SHALL BE VERIFIED IN THE FIELD. ANY DEPARTURE FROM CONCEPT SHOWN ON THE CONTRACT DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
4. ALL EQUIPMENT SHOWN SHALL BE SURFACE MOUNTED EXPOSED, EXCEPT THE CONDUIT AND WIRING FROM THE 9TH FLOOR ELECTRICAL AND TELEPHONE CLOSETS INTO THE INTO THE MECHANICAL EQUIPMENT ROOM.
5. IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM ON THESE DOCUMENTS IN ANY WAY. IF AN ITEM BEARING THE SEAL OF AN ENGINEER IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.
6. REFER TO STRUCTURAL DRAWINGS FOR SEISMIC BRACINGS AND SUPPORT DETAILS FOR INSTALLATION OF ELECTRICAL EQUIPMENT.
7. "SHEET" AS SHOWN ON THE ELECTRICAL DRAWINGS SHALL MEAN "DRAWING NUMBER".

STAGING PLAN

1. INSTALL ALL EQUIPMENT SHOWN EXCEPT CIRCUIT (A1). DO NOT INSTALL UPS BATTERIES UNTIL THE EMERGENCY EYE WASH STATION HAS BEEN INSTALLED.
2. INSTALL THE 250 MCM FEEDER (A1) BETWEEN EXISTING PANELBOARD EPP-8E AND THE 150AF/200A FDS, BUT DO NOT MAKE THE SPLICE AT PANELBOARD EPP-8E. LEAVE THE 150AF/200A FDS OPEN.
3. COORDINATE WITH THE ENGINEER THE SHUTDOWN OF THE EXISTING 250 MCM RISER FEEDING PANELBOARDS EPP-3E, EPP-6E, AND EPP-8E. OPEN THE 3P225A BREAKER IN (BASEMENT) PANELBOARD EDP-E. MAKE THE SPLICE AS SHOWN IN FEEDER SPLICE DETAIL, DRAWING E-804. CLOSE THE 3P225A BREAKER IN PANELBOARD EDP-E. CLOSE THE 150AF/200A FDS. THIS WILL ENERGIZE ALL THE EQUIPMENT.
4. EXISTING COMMUNICATIONS EQUIPMENT LOCATED IN THE PLENUM ROOM SHALL BE RELOCATED BY OTHERS. SOME COMMUNICATIONS EQUIPMENT CABINETS ARE HARD-WIRED. SOME HAVE RECEPTACLE OUTLETS MOUNTED DIRECTLY ON THE CABINETS. SEE REMOVAL PLAN, SHEET E-811. COORDINATE REQUIRED REMOVAL WORK TO MINIMIZE DOWNTIME OF THE EQUIPMENT TO BE RELOCATED. PROVIDE 15 AMP RATED CORD AND PLUG ATTACHMENTS WITH STRAIN-RELIEF CONNECTORS TO EXISTING HARD-WIRED EQUIPMENT, FOR RE-CONNECTING TO RECEPTACLE OUTLETS.
5. AFTER THE EXISTING COMMUNICATIONS EQUIPMENT TO BE RELOCATED HAS BEEN REMOVED FROM THE PLENUM ROOM, REMOVE ALL CONDUIT, WIRING, RECEPTACLE OUTLETS, LIGHTING, ETC. BACK TO THE "CELLULAR" PANEL. SEE REMOVAL PLAN, DRAWING E-811. REMOVE CAGE AND ALL ASSOCIATED ELECTRICAL EQUIPMENT FEEDING EXISTING COMMUNICATIONS EQUIPMENT IN CAGED AREA AFTER CUTOVER. COORDINATE WITH THE ENGINEER. REMOVE CONDUIT AND WIRING BACK TO PANEL. PATCH ANY HOLES LEFT BY REMOVAL OF EQUIPMENT INCLUDING REMOVAL OF ANTENNA CABLES. PROVIDE AND INSTALL KNOCKOUT CLOSURES IN "CELLULAR" PANEL AS REQUIRED.

LEGEND

———○	CONDUIT AND WIRING TURNED UP
———●	CONDUIT AND WIRING TURNED DOWN
———	CONDUIT AND WIRING INSTALLED EXPOSED
—— E ——	EXISTING CONDUIT AND WIRING
—·— E —·—	EXISTING CONDUIT AND WIRING TO BE REMOVED
———]	CAPPED CONDUIT
═══	CABLE TRAY, ALUMINUM, OPEN LADDER, 12" x 4", WITH DROPOFFS EVERY 2' OVER RADIO EQUIPMENT
	EXISTING PANELBOARD
—— G ——	GROUNDING CABLE (#1/0, #4/0, OR #2, AS SHOWN ON PLANS)
----▷----	RELAY OPERATOR LINE
▬	PANELBOARD
100AF / 100A	FUSED DISCONNECT SWITCH 100AF – INDICATES FUSE AMPERE RATING 100A – INDICATES DEVICE AMPERE RATING
100A	UNFUSED DISCONNECT SWITCH 100A – INDICATES DEVICE AMPERE RATING
	DUPLEX CONVENIENCE RECEPTACLE, 15A, 125V, 3 WIRE GROUNDING TYPE, HUBBELL #5262-I OR APPROVED EQUAL, WITH TYPE 302/304 STAINLESS STEEL FACEPLATE, HUBBELL #S8 OR APPROVED EQUAL.
WP,GFI	DUPLEX CONVENIENCE RECEPTACLE, 15A, 125V, 3 WIRE GROUND FAULT INTERRUPTING TYPE, BRYANT # GFR52FT-I OR APPROVED EQUAL, WITH NEMA 3R "WEATHERPROOF WHILE IN USE" DEEP COVER, TAYMAC #20510 OR APPROVED EQUAL
J	JUNCTION BOX
	RADIO EQUIPMENT
	ELECTRICAL EQUIPMENT
UPS-7,9,11	HOME RUN TO PANEL "UPS" FOR CIRCUIT NUMBERS 7, 9 AND 11. 3-1/C #12, 1-1/C #10G & 1-1/C #12G IN 3/4"C (TYPICAL)
a F-1	WALL MOUNTED FLUORESCENT LIGHTING FIXTURE, 120V 4' LENGTH, WITH 2-32 WATT OCTRON LAMPS, DAYBRITE #AB232-AO-120 WITH ADVANCE POWERKUT 60Hz BALLAST #RX2S32TP OR APPROVED EQUAL. SUB LETTER DENOTES CONTROL. WALL MOUNT AT 9'-0" AFF TO TOP OF FIXTURE.
b F-2	CEILING MOUNTED FLUORESCENT LIGHTING FIXTURE EXPLOSION-PROOF, CLASS I, DIVISION 2, GROUP B, 4' LONG, WITH 3-32 WATT OCTRON LAMPS, AND ADVANCE #REL3532RHTP SOLID STATE BALLASTS, 120V, APPLETON #RS-3321250, WITH #DR-NAC MOUNTING BRACKETS, AND 3/4" TO 1/2" REDUCING HUBS OR APPROVED EQUAL. SUB LETTER DENOTES CONTROL.
d F-3	INDUSTRIAL FLUORESCENT LIGHTING FIXTURE 4' LONG, WITH 2-32 WATT OCTRON LAMPS, 120V, BAKED PORCELAIN ENAMEL FINISH, 10% UPLIGHT, DAYBRITE #1F232-PR-120 WITH ADVANCE POWERKUT 60Hz BALLAST #RX2S32TP OR APPROVED EQUAL. MOUNTED WITH THREADED POD AT 9' AFF. SUB-LETTER DENOTES CONTROL.
	WALL MOUNTED FLUORESCENT EXIT LIGHT, 120V, SINGLE FACE, WITH INTEGRAL 90 MINUTE BATTERY BACKUP AND FLUORESCENT LAMPS, HUBBELL #X2571-R-KS/017K OR APPROVED EQUAL.
E1, E2	EMERGENCY LIGHT WITH TWO HEADS POSITIONED AS INDICATED, WITH INTEGRAL 90 MINUTE BATTERY BACKUP, SUBSCRIPT DESIGNATES MODEL E1: HUBBELL #-P12-36-2-P12H OR APPROVED EQUAL. E2: CROUSE-HINDS #12LPS6222 OR APPROVED EQUAL, WITH TIME DELAY RELAY FIELD SET AT 5 SECONDS.
$S_{a,b}$	SINGLE POLE LIGHTING CIRCUIT SWITCH, WALL MOUNTED AT 45" AFF, SUB-LETTER DENOTES CONTROL. HUBBELL #1221-I OR APPROVED EQUAL. WITH TYPE 302/304 STAINLESS STEEL FACEPLATE, HUBBELL #S1 OR APPROVED EQUAL.
A	AIR FLOW SWITCH, SEE MECHANICAL PLANS FOR CATALOG #.
H	ALARM HORN (LOSS OF AIR FLOW), SEE MECHANICAL PLANS FOR CATALOG #. WALL MOUNTED AT 90" AFF
	MOLDED CASE THERMAL MAGNETIC CIRCUIT BREAKER
S	IONIZATION TYPE SMOKE DETECTOR, CERBERUS PYROTRONICS #FP-11, WITH DB-11 MOUNTING BASE
D	DUCT MOUNTED, IONIZATION TYPE, SMOKE DETECTOR, CERBERUS PYROTRONICS AD-3XI DUCT HOUSING WITH ILI-1B ADDRESSABLE DETECTOR AND STA-6 SAMPLING TUBE SIZED TO LENGTH IN FIELD
N	LOW VOLTAGE MOTOR STARTER, FULL-VOLTAGE, NON-REVERSING, N INDICATES SIZE
N	MOTOR, N INDICATES HORSEPOWER
D	MOTORIZED DAMPER, SEE MECHANICAL DRAWINGS
TN	THERMOSTAT, N DENOTES NUMBER, SEE MECHANICAL PLANS FOR CATALOG #'S. THE THERMOSTAT AND ASSOCIATED WIRING LOCATED IN THE BATTERY ROOM SHALL BE EXPLOSION-PROOF, NEC CLASS I, DIVISION 2, GROUP B.
F-14 / 21	BUILDING COLUMN NUMBER
▨	SYNTHETIC RUBBER MAT, ACID-PROOF, SIZED AS SHOWN ON PLANS
F 1/2 W 15CD	FIRE ALARM SPEAKER AND STROBE UNIT, WALL MOUNTED AT 80" AFF, WHEELOCK #ET70-2415W-FR WITH BACKBOX # SBB. RATINGS IN WATTS AND CANDELA
TSC	TERMINAL STRIP CABINET (EXISTING/FIRE ALARM SYSTEM)
TR	FIRE ALARM SYSTEM ADDRESSIBLE INTERFACE WITH FORM C CONTACTS RATED 1A INDUCTIVE CERBERUS PYROTRONICS #TRI-B5R
○	CABLE TRAY SUPPORTS. SEE DETAILS IN STRUCTURAL DRAWINGS
	COMBINATION MOTOR STARTER AND FUSIBLE DISCONNECT SWITCH
DC-1	DIRECTIONAL COUPLER (DC) DC-1 DENOTES EQUIPMENT NUMBER
	DIRECTIONAL ANTENNA
COMMON PORT 800 450 VHF CBC-33	CROSS BAND COUPLER (CBC) CBC-33 DENOTES EQUIPMENT NUMBER 800 DENOTES 800-900MHz FREQUENCY BAND 450 DENOTES 450-512MHz FREQUENCY BAND VHF DENOTES 80-170MHz FREQUENCY BAND
RBS-1 (TYPICAL)	RADIO BASE STATION
S L L SSC-1	SIGNAL SPLITTER & COMBINER (SSC) S-SOURCE L-LOAD SSC-1 DENOTES EQUIPMENT NUMBER
DC-3 HYBRID DIRECTIONAL	HYBRID DIRECTIONAL COUPLER (SIGNAL SAMPLER) DC-3 DENOTES EQUIPMENT NUMBER
L	LOAD
LA	LIGHTNING ARRESTOR, SEE DRAWING E-808
	1 1/4" HELIAX COAXIAL CABLE
	7/8" HELIAX COAXIAL CABLE
	1/2" HELIAX SUPERFLEXIBLE COAXIAL CABLE
	1/4" SUPERFLEXIBLE JUMPER CABLE

NOTE: RADIO TRANSMISSION CABLE RUNS LESS THAN 10' NOT DESIGNATED

Sheet 93 of 110

THE PORT AUTHORITY OF NY & NJ

11/17/97

068565

ORIGINAL SIGNED & SEALED BY N.Y. P.E. (OR R.A.)

Ram Communications Consultants, Inc.
10 Woodbridge Center Drive
Woodbridge, NJ 07095
(908) 636-6970 fax (908) 636-7260

I HEREBY CERTIFY THAT THIS IS A TRUE AND CORRECT COPY OF ONE OF THE CONTRACT DRAWINGS CONSTITUTING A PART OF CONTRACT NO. WTC-945.071 IN THE FORM IN WHICH SAID DRAWINGS EXISTED AT THE TIME THE SAID CONTRACT WAS EXECUTED BY THE PARTIES.

DATE 1/16/98 Sultan A. Aslam
SPEC WRITER

DATE 4/10/98 P.K.
ENGINEER OF DESIGN

No.	Date	Revision	Approved

The World Trade Center

Title

STANDBY POWER
5 WORLD TRADE CENTER

COMMUNICATIONS

LEGEND, GENERAL NOTES, STAGING PLAN, AND ABBREVIATIONS

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

D.S.	R.N.	D.S.
Designed by	Drawn by	Checked by

Date

Scale NONE

Contract Number WTC-945.071

Drawing Number E-801